

A Study on Sustainable Urban Development and Remedy for Environmental Changes

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Abstract

As per the United Nation's report, the urban population in India goes to achieve over 600 million by 2031, increase of around four-hundredth of the population. Currently, virtually ten percent of Indian gross domestic product is predicated on construction activities and is very important for Indian economy. However, this resulted in environmental degradation. Natural resources degradation (Air, soil, and water etc.) associate degreed increasing waste matter thanks to urbanization has become a challenge for an economy to sustain. The property urban management has become one in every of the vital problems recently. Recently developed inexperienced Building conception is that the potential resolution and key to property urban development. it's the apply skyrocketing potency with that buildings use resources – energy, water and materials – whereas reducing building impacts on human health and therefore the setting. These practices are healthy and a lot of resources economical within the method of siting, construction, renovation, operation, maintenance and demolition. This consists of life cycle assessment (LCA) based mostly coming up with for inexperienced building. Therefore, all appropriate the appropriate} technologies and innovative concepts offered in numerous areas betting on native resources are suitable to form the inexperienced building environment- friendly. inexperienced building technology is so undergoing constant changes and obtaining a lot of improved with the time. Government ought to additionally guarantee correct pointers for property construction activity to implement this idea and to scale back environmental degradation. Keywords: inexperienced Building, Impacts, property Development, Urbanization.

Key words: *property urbanization, Human discomfort, Impacts of construction, health considerations.*

Introduction

World Population is chop-chop increasing since mid-20th Century. This has resulted in increasing demands for natural and unreal resources. Intelligent creature has created tremendous progress in technology in numerous fields to satisfy the ever-growing demands. Most of the events are meted out while not dominant the unwell effects of the development. As a result, the pollution of air, water and soil has affected the standard of setting and offered resources depriving the share of our next generations of their due share of natural resources. there's currently increasing awareness concerning this and principles of property development are developed and being applied throughout the globe. However, we tend to are removed from achieving the property development. Population increase is leading to fast urbanization particularly in developing countries that is one in every of the factors chargeable for heating. The effective remedy for this is often to develop and implement eco-construction technique, that is currently popularly called inexperienced Building conception. this text summarizes the assorted aspects of urbanization and heating and therefore the summary of inexperienced building conception at the side of pointers and ratings developed worldwide to realize inexperienced Buildings which can be helpful in development of property urbanization.

Impacts of Un-Planned Construction Activity

ancient buildings or homes in India were energy economical as a result of design trusted the places. They were having thick walls acting as insulators. Buildings within the hot and dry regions had corridors directional the wind to cool down naturally. In wet regions, structures exploitation natural lightweight and breeze were used (Business customary, twenty six March 2010). The notable examples are Haw Mahal or Palace of Winds or Palace of the Breeze in Jaipur, India, with articulated windows that offer cool breeze in an exceedingly desert space and Golkonda wherever ventilation is meant to let in contemporary cool breeze, in spite of summer However, recent concrete constructions lack environmentally friendly style.

The building and construction sector and its sprawling growth have a major impact on the setting and resources. As per the Millennium system Assessment Study 2005, it's been determined that there has been over sixty-two decline within the availableness of natural resources within the last four decades. the \$64000 estate trade has been one in every of the many energy shopper and inexperienced house gas (GHG) emitters. This sector despite having over five hundredth share of resources, additionally account for over three hundred

and sixty-five days of all the waste generation worldwide. The particulate matters and therefore the different unsafe substances used and emitted throughout construction activities are adequate to contribute in setting degradation. The waste has non-recyclable materials like wastes containing mercury, fluorescent bulbs, batteries, unsafe waste, and lead based mostly paints etc., that create serious environmental and health considerations. one in every of the impacts of construction sector is creation of Urban Heat Islands (UHI) resulting in hotter cities.

Sector is creation of Urban Heat Islands (UHI) leading to hotter cities Heat islands square measure fashioned because of following factors:

- ❖ Low spacing between buildings, and building dimensions,
- ❖ comparatively dense building materials that square measure slow to heat and funky and store plenty of energy,
- ❖ Replacement of natural surfaces by proof or water proof surfaces, resulting in a drier geographic area, wherever less water is accessible for evaporation, that offsets heating of the air,
- ❖ Lower surface reflectivity to radiation dark surfaces like asphalt roads absorb additional daylight and become a lot of hotter than pale surfaces,
- ❖ Waste heat generated by energy usage could be a secondary contributor.

UHI is most noticeable throughout the summer and winter. Monthly downfall is larger downwind of cities, part because of the UHI. will increase in heat at intervals urban centres will increase the length of growing seasons, and reduces the prevalence of weak tornadoes. The UHI decreases air quality by increasing the assembly of pollutants like gas and reduces water quality as hotter waters flow into space streams and place stress on their ecosystems. Heat islands ends up in human discomfort, health risks, increase in energy use, pollution, unleash of inexperienced house gases, and better prices because of larger water and energy use. With the increasing urbanization everywhere the globe, particularly in tropical countries, it's potential to contribute to warming directly or indirectly. Around sixty one of population is predicted to measure in geographic area by 2030. this may increase the impact of urban heat islands on human health similarly as on warming directly and indirectly. The observations on the temperature change over massive cities over the past century show similarities with

projected future climate changes. Thus, cities could function a model for assessing the impacts of, and adaptation ways to, temperature change on each native and world scales.

History of Inexperienced Building conception

Green buildings inexperienced homes have solely been increasing by people and firms for the past thirty years. inexperienced movement has been perpetually growing throughout this era. throughout the energy crisis of the 1970's, inexperienced building emotional from analysis and development to reality. so as to scale back the employment of fossil fuels in homes, star panels were accustomed build additional environmentally friendly homes, though in little numbers because of high initial prices.



once development of additional economical and fewer costly star panels to form building additional economical, it had been then utilized in massive numbers. at the side of this, builders and customers began to seek for alternative techniques to form even greener homes. This has light-emitting diode to eco-construction. an outsized variety of problems and steps that facilitate to form inexperienced home square measure currently used. Today, we have a tendency to square measure still at the start of the Eco-construction movement.

Green Building Concept

an outline inexperienced building or inexperienced homes or property building refers to each a structure and also the mistreatment of the processes that square measure environmental accountable and resource-efficient throughout a building's life cycle from

siting through construction, operation, maintenance, renovation, and demolition. it's the observe of accelerating potency with that buildings use resources – energy, water and materials – whereas reducing building impacts on human health and also the surroundings. inexperienced building conception is gaining importance in varied countries, as well as India. property development is just meeting the wants of gift generation while not compromising the wants of future generations. property assets development activities square measure necessary for achieving development with ecological concern. property inexperienced building conception contains a special concern for natural resources management, human safety, energy potency, use of recycled materials etc. The practices followed square measure healthy and additional resources economical within the method of siting, construction, renovation, operation, maintenance and demolition. inexperienced measures will facilitate in rising the ecological surroundings and helps in reducing energy uses by a minimum of 30-35%, carbon emission by thirty fifth and wastages by seventieth and use of water by quite four-hundredth. The strategies to construct an inexperienced home square measure straightforward and straightforward. All the concepts or techniques which will save energy will be enforced in making a inexperienced area for the family.



These could amendment from place to position, relying upon native surroundings and infrastructure accessibility. a number of the common strategies square measure siting and structure, style potency, light-weight coloured roofs and pavements, planting trees round the buildings to shade urban surfaces to scale back urban heat, inexperienced roofs mistreatment

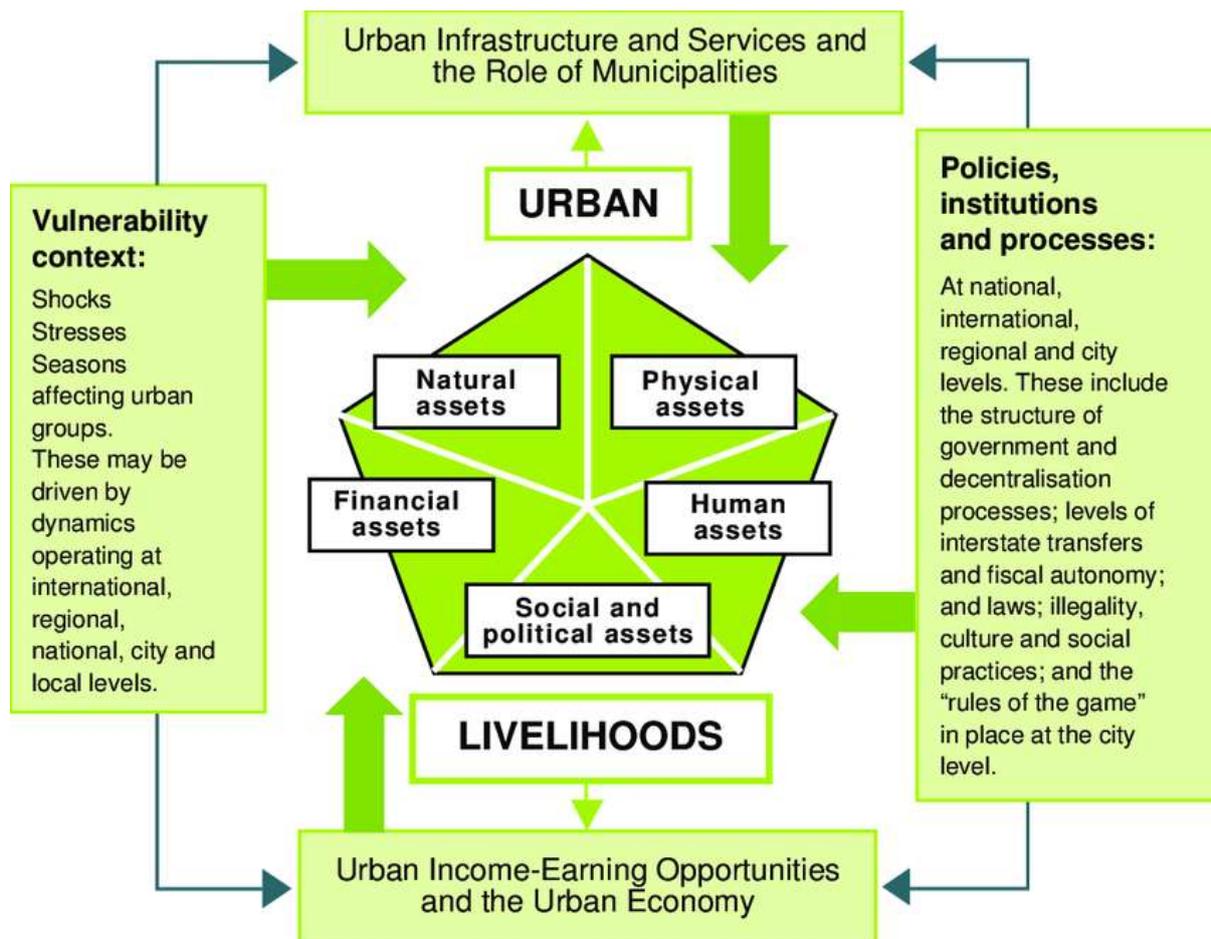
terrace garden (the town of Chicago has quite eighty municipal inexperienced roof within the country), creation of inexperienced areas like parks, rain gather, economical use of energy, use of solar power, use of renewable resources, utilisation of solid and liquid waste, use of world category energy economical practices, water and alternative resources, pollution and environmental degradation, indoor environmental quality sweetening, operations and maintenance optimisation and waste and toxics reduction, the star tiles paper insulation, triple-glazed windows. Shading of vehicles in parking tons will cut back phase change emission from petrol, that contribute to magnified levels of urban gas.

Green Building Policy and Codes

ISO21931:2006, property in Building Construction - Framework for strategies of Assessment for Environmental Performance of Construction Works – half 1: It identifies and describes problems to be taken into consideration once mistreatment strategies for the assessment of environmental performance for brand spanking new or existing properties within the style, construction, operation, melioration and philosophical doctrine stages. it's not solely AN assessment system in itself however it's supposed be utilized in conjunction with, and following the principles started in, the ISO 14000 series of standards. In India, the connected policy and codes are: National codification (NBC), The Bureau of Indian Standards (BIS), Energy Conservation codification (ECBC), The Bureau of Energy potency (BEE), and Environmental Impact Assessment (MoEF&CC).

Planning an inexperienced Building

The successful coming up with of a inexperienced building needs analysis of the Life Cycle Assessment (LCA) by assessing a full vary of environmental, economic and social impacts related to all cradle-to-grave stages of a method. this can facilitate to spot the necessary problems during a specific set of atmosphere and native conditions, and consequently coming up with are often done to realize property inexperienced building. LCA is well known because the best thanks to value the environmental impacts of building. ISO 14040 provides a recognized LCA methodology. However, rating of inexperienced building considers factors on the far side LCA conjointly.



Green Building Rating Systems in Republic of India

The International Finance Corporation (IFC), a member of the globe Bank cluster, and therefore the Confederation of realty Developers' Associations of Republic of India (CREDAI), apex body of personal realty developers, have partnered to market inexperienced buildings within the country through IFC's EDGE certification. MoU was signed within the presence of Minister for atmosphere and Forests Prakash Javadekar on Nov twenty five, 2014. The inexperienced building evolution has crystal rectifier to the emergence of the many rating systems. India, with associate degree increasing footprint of inexperienced building, has primarily three rating systems specifically GRIHA-TERI (Green Rating for Integrated environment Assessment from the Energy & Resources Institute) , LEEDS-IGBC (Leadership in Energy and Environmental style from Indian inexperienced Building Council) and EPI-BEE (Energy Performance Index from Bureau of Energy potency, Government of India) [. The GRIHA TERI rating has been one amongst the freelance rating systems of inexperienced buildings developed by The Energy & Resources Institute (2015) and Ministry of latest and Renewable Energy, Government of Republic of India. supported the weightage of assorted inexperienced indicators, the buildings area unit certified.

LEED-IGBC certification

Leadership in Energy and Environmental style (LEED) developed by u. s. inexperienced Building Council (USGBC) [14] provides a whole framework for assessing building performance and meeting property goals. Indian inexperienced Building Council (IGBC), a noncommercially analysis establishment has license from the u. s. inexperienced Building Council to supply such certifications for inexperienced structures. LEED-IGBC certification system has levels/ratings and therefore the thresholds that area unit shown in Table I. LEED considers better of the scientific measures and techniques for the property web site development, water savings, energy savings, energy potency, material choice and indoor environmental quality. In India, there are a unit around one hundred fifty registered inexperienced buildings, out of that solely twenty three area unit LEED certified. IGBC in line with the rating standards and measures outlined by USGBC, following classes of structures area unit classified for inexperienced ratings.

LEED Republic of India for brand spanking new Construction

- ii. LEED Republic of India for Core and Shell
- iii. IGBC inexperienced Homes
- iv. IGBC inexperienced plant Building
- v. IGBC inexperienced SEZ vi. IGBC inexperienced Townships

GRIHA-TERI Certification

Inexperienced Rating for Integrated environment Assessment (GRIHA), associate degree freelance inexperienced building performance classification system developed by The Energy & Resources Institute (TERI) and Ministry of latest and Renewable Energy, Government of Republic of India [13]. The Energy & Resources Institute (formerly TATA Energy analysis Institute) is one amongst finest noncommercially world think factory within the space of energy, atmosphere and property development. GRIHA essentially is inexperienced building style analysis system wherever the buildings area unit rated during a tier method i.e. initiation documents submission, visit by the professionals and consultants from GRIHA Secretariat and analysis supported numerous parameters supported completely different sections. There are a unit primarily thirty four criteria to assess and value the inexperienced performance as per the set pointers of GRIHA below completely different sections. broadly speaking a number of them are:

- ❖ Site choice and web site coming up with
- ❖ Conservation and economical utilization of resources
- ❖ Building operation and maintenance iv. Innovation.

The weightage points score supported numerous parameters area unit rated consequently. purpose based mostly scores or performance that area unit given star ratings, area unit exhibited.

EPI- BEE Certification

Energy Performance Index (EPI) is that the building performance classification system developed by Bureau of Energy potency, Government of Republic of India (BEE) [15]. The rating systems outlined by BEE area unit supported a one to 5-star scale wherever additional stars mean additional energy potency of the priority. during this performance index, the unit of metric weight unit watt hours per centare each year (kwh/sq m/year) is taken into account for the buildings rating. The label provided below the theme is applicable for a five year amount. numerous classes like workplace buildings, searching malls, hotels, hospitals and IT parks area unit known and given star marks as per the 5 climatical zones within the country below this theme.

Green Building classification system in different Countries

inexperienced Building style and resolution helps in minimizing the interference on atmosphere, use of atmosphere friendly material, utilization of renewable energy etc. numerous performance practices and indicators of inexperienced buildings are taken worldwide within the past. a number of the inexperienced Building Rating Systems followed worldwide are often listed as:

- BREEAM: Building analysis institution atmosphere Assessment methodology is developed and wide utilized in UK.
- LEED: Leadership in Energy & atmosphere style has been developed by u. s. inexperienced Building Council (USGBC) and is employed in U.S.
- inexperienced Star: inexperienced Star is that the inexperienced building classification system developed by Green Building Council of Australia (GBCA) and wide utilized in Australia. The New Zealand inexperienced Building Council has conjointly developed their own version of inexperienced star rating and is employed there.

- NABERS: National Australian engineered atmosphere classification system managed by New South Wales Department of atmosphere and temperature change is that the solely such classification system for mensuration in progress operation performance.
- CASBEE: Comprehensive Assessment System for Building Environmental potency developed by Japan property Building association (JSBC) wide utilized in Japan.
- Green Mark: Developed by Singapore and obligatorily used for all the event works.

Green Performance Indicators

The overall sustainable mechanism of construction industry depends upon various factors. The consideration of natural/ecological concerns primarily measures the green performance rating of a building. Green performance of a building is based on broadly five key parameters i.e. Sustainable Site, Water Efficiency, Energy and Atmosphere (Fig. 1) [16], Material and Resources and Indoor Environment Quality. Various other sub indicators under these above mentioned five indicators are used to assess and evaluate the performance of a building being carbon neutral.

Green Buildings in India

The performances of few of the green building projects in India are shown in Table III. Apart from these buildings, there are many green buildings in India namely Green buildings of Suzlon Energy Limited at Pune, Biodiversity Conservation India Ltd. (BCIL) at Bangalore, ITC Green Centre at, Gurgaon, The Druk White Lotus School at Ladakh etc. Eco-construction of green building is being done in India

Benefits of inexperienced Buildings

It's necessary to notice that inexperienced buildings do have a protracted term vital advantage as so much because the tangible (Operational savings, energy and water potency, waste reduction etc.) and intangible (Less ototoxic interiors, higher facilities etc.) advantages square measure involved. The energy (around 40-50 percent savings) and water (20-30 percent) savings, reduction in waste, improvement in indoor surroundings quality, larger comforts help in win lesser health value for workers or residents, lower operation and maintenance prices. The life cycle analysis for assessing the value profit associated for inexperienced buildings shows varied social, economic and environmental advantages (i.e. reducing impact of the engineered surroundings on human and ecological environment). Natural resources conservation provides pollution free surroundings, higher air quality, and higher productivity. Social advantages enhance occupier comfort and health heightens aesthetic qualities, minimize strain on native infrastructure and improve overall quality of life. Environmental advantages enhance and defend diverseness and ecosystems improve air and water quality, scale back waste streams, conserve and restore natural resources.

Economic advantages scale back operative prices, expand and form markets for inexperienced product and services improve occupier productivity, and optimize life-cycle economic performance. Therefore, the deserves of inexperienced building square measure economical technologies, easier maintenance, come back on investment, improved indoor air quality, energy and material potency, water potency, economical construction for poor, improvement of recreation. Demerits of inexperienced building square measure high initial value, non-availability of materials, would like longer to construct and wish expert employees. The governments during this regard have additionally created varied provisions and advantages for the builders and customers viz. Concession in Floor space quantitative relation for following inexperienced building norms, way environmental clearance for the comes, rebate in property taxes et al incentives further etc.

Conclusion

Inexperienced building idea is one among the solutions to reduce or minimize the impact of fast urbanization and construction sector. this idea has been developed recently and there's nice scope for its development by adding varied technologies and ways that additionally dissent relying upon the native resources and infrastructural facility. inexperienced buildings are useful to create the development business environmentally friendly reducing environmental degradation and protective resources for the longer-term generation and so achieving property development.

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